

Control of Invasive Plants by Intensive Grazing Practices Report for Year Ending December, 2003

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Participants: City of Tallahassee's Electric Department, City of Tallahassee's Parks Department, City of Tallahassee's Urban Forestry Division, Leon County's Division of Parks and Recreation, Leon County's Right of Way Management Division, State of Florida's Bureau of Invasive Plant Management.

I. Introduction.

The Control of Invasive Plants by Intensive Grazing Practices ("Project") has finished a fourth year of partnership between agencies of the State of Florida, the City of Tallahassee, and Leon County with Bellwether Solutions LLC, a vegetation management company, using sheep to suppress or eliminate kudzu and other invasive plants in target areas within the Tallahassee Area. The Project's fourth year has successfully continued the efforts begun in 2000, expanded the Project's scope, and started planning for the fifth year. This report summarizes the key elements of the experience gained over the past twelve months.

II. Project Overview.

The 2003 season continues to show that grazing has significantly suppressed and eradicated kudzu and other invasive plants in most of the original target areas. The experience on larger sites has also demonstrated that grazing is competitive with herbicides on a per acre cost. Grazing also continues to be effective in opening up areas of dense undergrowth that are accessible by any other technique. Grazing has proven itself to be competitive and in many cases superior to any other management tool currently available and to offer unique environmental benefits. Bellwether and the participating agencies continue to be extremely pleased by the performance of the sheep in controlling target species, by the successful management of the flock in a public, highly populated region, and by increasing the scale of this pioneering effort to over six times the original number of acres.

Bellwether grazed over six hundred forty single pass contract acres in 2003. The allocation for the City of Tallahassee participants in single pass acres is: Parks and Recreation, 275 acres; Municipal Electric, 64; Canopy Roads, 210. The allocation for Leon County is 364 single pass acres. The Department of Environmental Protection provided joint funding for 176 acres (some acres are allocated to more than one participant). This acreage was made possible by increased flock size, expanded Bellwether staffing, and the suppression achieved during the Project's first three years.

III. Sheep and Flock Management.

During 2003, seven hundred sheep grazed Project sites from May through mid-November. Part of the flock may continue grazing through December and into January on some rough sites for the City's Park's and Recreation Department; the feasibility of this will depend upon site security and winter weather conditions. The balance of the flock will be over wintered on leased property this year with a planted winter forage crop. 2004 winter lambing will be limited and allow contract grazing to begin earlier next spring.

The flock now consists entirely of Barbados Black Belly, St. Croix, Katahdin, and Dorper sheep. These breeds were originally chosen for their hardiness in a hot, humid climate expected in the Florida panhandle and have performed excellently. The summer heat was well tolerated; in fact water consumption was considerably lower than expected, possibly due to the high water content of the kudzu and the wet conditions prevailing in 2003. Approximately eight hundred lambs were born in 2003 which demonstrates the feasibility of sheep operations in this environment.

Portable electric net fencing was used to confine the sheep in appropriately sized pens that were moved every several days as the vegetation was consumed. This approach, known as intensive rotational grazing, uses large numbers of animals on small areas for short periods of time. It is designed to graze at a level that removes the maximum amount of forage while maintaining good health and body condition of the animals. The sheep were successfully moved to cover all the target areas. Operations improved to move animals more quickly and effectively between sites through a combination of herding and trucking. In some areas, it was possible to leave the sheep for longer periods due to the palatability of the kudzu, using a method known as set stocking.

There were severe health problems in 2003 due to the unusually wet year. The principal threat to flock health in this environment is intestinal parasites. A vigorous worming program to combat these has been carried out with the assistance of the University of Florida Veterinary School in Gainesville, Florida and the University of Georgia Veterinary School in Athens, Georgia since the inception of the Project. The head shepherd implemented new worming techniques half way through 2003 which have proved to be most effective. Bellwether is also now using a new program to select for worm resistant strains of sheep which should further reduce this problem. Canine predators, such as feral dogs and coyotes, are the second significant threat to flock health and are managed effectively by sheep guardian dogs.

There were several instances of stolen equipment and sheep in 2003. Live stock guardian dogs are essential to protecting the sheep and limiting vandalism in urban conditions but are not fool proof against a knowledgeable thief. Twenty three sheep were stolen in one incident which received national press coverage. Several batteries and fence chargers were stolen in other incidents. Even so, the guardian dogs continue to be the best protection available for stock and equipment. All city, county and state personnel must continue to appreciate the role of these working dogs and contact the shepherd immediately

should any issues arise. The close attention of the shepherd and prompt cooperation of local authorities has kept problems to a minimum given the populated communities surrounding the target sites but "sheep rustling" is potentially a highly disruptive type of vandalism.

A shepherd was on site throughout the Project to manage the sheep on a daily basis, coordinate the various components of the Project, respond to the public, and evaluate the impact of grazing on the kudzu. All involved authorities have the shepherd's cell phone number and have been able to promptly notify the shepherd of any issues needing immediate attention. Cooperation between the Project staff and all city, state, and county personnel has been excellent.

IV. Kudzu Suppression.

A. Overview

The Project is based on the hypothesis that grazing works because kudzu cannot tolerate repeated defoliation combined with the mechanical damage of the flock's hooves. The evidence from the 2000, 2001, 2002, and 2003 seasons indicates that the sheep effectively suppress kudzu and have an even more severe effect than originally expected. Surviving plants show evidence of significant stress; more remarkably, kudzu stands on some sites seem to have been eradicated after three years of grazing with minimal follow-up in 2003. The areas of eradication are behind the Dog Pound, next to the Racquet Ball Courts at Tom Brown Park, along Weems Road, and along the Miccosukee Greenway at Miles Johnson Road.

After the sheep establish a four-foot high browse line in each area, the Project staff also cut the kudzu vines that reach into the tree canopy to impair the plant's ability to replenish energy reserves in the root systems. As a result, the plants cannot recover as easily from the direct impact of grazing and fewer passes are needed to achieve eradication. For the 2003 season, workers continued to cut vines, returning to sites multiple times to insure that all vines were cut.

B. Specific Sites.

1. Tom Brown Park and Piney Z. The main areas grazed in Tom Brown Park were: the area behind the Dog Pound to Weems Road and the railroad tracks, the area near the Racquet Ball Courts, and the area along Connor Boulevard under the transmission lines. All of the sites in Tom Brown Park were grazed three times.

By the end of the 2002 grazing season, kudzu in the area adjacent to the Racquetball Courts was completely eliminated. The 2003 season seemed to have a similarly dramatic impact on the areas behind the Dog Pound, along Weems road, and around the substation all the way down to the railroad tracks. (See accompanying photographs) The kudzu stand at the old National Guard Firing Range has been further suppressed but still needs additional work in the coming year.

It has taken the kudzu much longer to rebound between grazing passes than first estimated. In Tom Brown Park only three rotations were possible by the end of the grazing season. Even without a killing frost by the end of September, the kudzu in these severely grazed areas has essentially stopped growing. In addition to Tom Brown, the site at Piney Z was also grazed three times with dramatic effect.

2. Leon County - Miccosukee Canopy Road Greenway. The Miccosukee Canopy Road Greenway (Miccosukee Greenway) was mob grazed with a small flock of sheep on the Miccosukee Greenway at Miles Johnson Road. The sheep covered this part of the Miccosukee Greenway acreage at least four times during the season. The sheep have such a high preference for kudzu that they quickly defoliate any regrowth. In addition the area

from Edenfield Road almost to Fleischman Road was grazed once opening up the under story to be followed by a herbicide crew taking out privet. Other portions of the Miccosukee were also grazed at least twice and in some cases three times, these included the Edenfield Road kudzu patch, the homestead patch east of the Powerhouse Farm entrance, and the lygodium patch east of Route 10.

3. Leon County - J. R. Alford Greenway. Grazing in the J.R. Alford Greenway was grazed twice at the test plot in A and the island C.

4. Leon County - Lake Jackson. The new park area at Lake Jackson was grazed twice for the County.

5. Electric Department Sites. The transmission line and substation at Tom Brown Park were grazed three times in 2003. As a result, kudzu was completely eliminated under the transmission line and around the sub-station near Weems Road. In addition, the substation at Lipona Street was grazed twice this year almost eliminating that kudzu stand and opening up the rough vegetation around the sub-station. As a result of this grazing, much of the marshy wet areas are drying faster and grass is coming in nicely. The Lafayette Street Indian Head Ravine substation was also grazed twice in 2003. Kudzu has been significantly suppressed here but another year of grazing will probably be needed to eliminate it or to keep it at its much reduced state. It is now possible to mow easily around the substation. (See accompanying photographs).

6. Urban Forestry. Many of the sites described above fall under both the jurisdiction of Leon County and the Urban Forestry Division. The Director of Urban Forestry, Carlos Conerly, has also been instrumental in introducing the concept of contract grazing to private developers as another tool available to control invasive exotics throughout the City. As with the development of any new approach, collaboration with the private sector has initially taken a great deal of Bellwether's staff time to implement as well as the efforts of the Urban Forestry Division. Ultimately, using grazing to control target species on a variety of sites both public and private will lead to more successful management of invasive and exotic plant species throughout the City of Tallahassee and Leon County. Several other developers have been in contact with Bellwether at the suggestion of either Carlos Conerly or the Tallahassee Planning Department. This led to a successful contract with Target Stores for the conservation property adjacent to Target on Apalachee Parkway.

V. Capital and Operational Resources.

The achievements of 2003 are especially notable given the difficult financial and planning conditions encountered during the past year. Unanticipated changes in the State Bureau of Invasive Plant Management contribution to the Project greatly delayed effective use of the sheep and reduced the State's contribution to the Project from \$50,000 in 2001 to approximately \$19,000 in 2003. As a result, effective funding for 2003 was even less than for 2002. This is not a sustainable level of support for the Project. All the participants have worked hard to increase funding for 2004 by increasing the number of contract acres and seeking additional funding.

Because of its long term commitment to the Project, Bellwether Solutions continued to make major capital and operational investments in the Project beyond the ordinary replacement of stock and equipment. An additional ATV was added and the two assistant shepherds complete the Tallahassee staff. Meaghan Thacker, the master shepherd, continues her excellent management of the entire Project. Bellwether's President, Dick Henry, traveled to Tallahassee six times in 2003 to assist in the Project's oversight and coordination with the

participants. His unique experience with major contract grazing programs in the Northeast has been vital to the development of the Tallahassee Project.

The significant capital and operational commitments described above represent an investment exceeding several hundred thousand dollars made by Bellwether to meet the evolving needs of the participating agencies. Bellwether has been able to spread these costs over the anticipated five-year life of the Project so that all the participants can benefit from the most economical approach to providing services. The equipment, animals, and staff make possible important additions to the Project to take advantage of its initial successes and to further the goal of effective vegetation management in the City, County, and beyond. Bellwether is in an excellent position to graze an expanded number of acres and maintain the project as long as additional funding becomes available for 2004.

V. Public Relations.

The Project has generated tremendous public support on many fronts. The positive feedback from the residents of Tallahassee as well as visiting tourists has been overwhelming. Interested spectators during the day and evening are common. The Project continues to receive excellent local, state, national and this year international coverage. This excellent exposure for the Project and the Tallahassee area was further enhanced when the international Television Program "Dogs with Jobs" spent three days filming the project in the early fall. This program "Cinder the Urban Shepherd" then aired from December through February in the Tallahassee area on National Geographic's Television Channel and was shown in over fifty other countries around the world. The Reader's digest interviewed a variety of participants for a future article about the project. National Public Radio featured the project on both Saturday Weekend Edition as well as Wait Wait Don't Tell Me. Lastly the project was featured in an article written by the German equivalent of our AP Wire Service.

All the publicity given the Project has led to interest from others involved in controlling invasive exotic species. Mr. Henry, Mr. Conerly, and Mr. Schenk have spoken about the project at several conferences. The project continues to draw regional and nationwide interest.

VII. Conclusion.

We believe all of the Project's participants should be proud of the successes of our first four years. This pioneering effort to use grazing animals to control invasive plants such as kudzu has produced impressive results in the field and enormous public support. The fifth year will focus on grazing more acres with an emphasis on areas such as Lake Jackson and new sections of the Canopy Greenways within the City and the County. Management of other types of invasive exotic plants, possible fuel reduction projects, forestry applications, and increasing grazing acreage are all goals for 2004. Bellwether looks forward to continuing and enhancing this important and innovative work in partnership with the City and County agencies that have made this exciting enterprise possible.